DYNAMICALLY RECONFIGURABLE VISION SYSTEM

Abstract

A closed-loop vision system is disclosed that utilizes a concept known as Dynamically Reconfigurable Vision (DRV), which is adaptive image sensing driven by a computer or human operator's response to changing scenery. The system reduces the amount of irrelevant video information sensed and thus achieves more effective bandwidth and computational resource utilization, as compared to traditional vision systems. One or more reconfigurable photodetector arrays sensitive to either visible, infrared or ultraviolet radiation are present in the DRV system. These photodetector arrays feature on-chip means for spatial and temporal data reduction implemented through multiple independently controllable, time-correlated, frequently overlapping windows on the photodetector array that may be programmed according to their size, location, resolution, integration time, and frame rate. All photodetector array windows are dynamically reconfigurable in real time on a frame-by-frame basis. Furthermore, a DRV system is constructed in a client-server architecture in which a vision processor client passes window request command messages to the reconfigurable photodetector array server, which in turn delivers the requested video back to the client processor. The ability to simultaneously reconfigure, integrate, process, and readout multiple photodetector array video windows is an important characteristic of the DRV system.